

10627552



US006264629B1

Rar

(12) **United States Patent**
Landau

(10) **Patent No.:** **US 6,264,629 B1**
(45) **Date of Patent:** ***Jul. 24, 2001**

(54) **SINGLE-USE NEEDLE-LESS HYPODERMIC JET INJECTION APPARATUS AND METHOD**

(75) **Inventor:** Sergio Landau, Laguna Niguel, CA (US)

(73) **Assignee:** Bioject, Inc., Portland, OR (US)

(*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/252,131

(22) **Filed:** Feb. 18, 1999

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/195,334, filed on Nov. 18, 1998, now Pat. No. 6,096,002.

(51) **Int. Cl.⁷** A61M 5/30; A61M 37/00

(52) **U.S. Cl.** 604/68; 604/69; 604/143

(58) **Field of Search** 604/68-72, 140, 604/141, 143, 148, 232, 131

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,688,765 * 9/1972 Gasaway 128/173 H

4,266,541 5/1981 Landau .
4,592,742 6/1986 Landau .
4,596,556 * 6/1986 Morrow et al. 604/70
4,652,261 * 3/1987 Mech et al. 604/130
4,790,824 * 12/1988 Morrow et al. 604/143
5,080,648 1/1992 D'Antonio .
5,318,522 6/1994 D'Antonio .
5,569,190 10/1996 D'Antonio .
5,921,967 * 7/1999 Sadowski et al. 604/218

OTHER PUBLICATIONS

Vitajet Industria e Comércio Ltda. Ommijet sales brochure, 4 pp, Rio de Janeiro, Brazil, undated.

* cited by examiner

Primary Examiner—Richard K. Seidel

Assistant Examiner—Michael Hayes

(74) *Attorney, Agent, or Firm*—Terry L. Miller

(57) **ABSTRACT**

A gas-powered, single-use, needle-less hypodermic jet injection device includes a hand-held injector, and a drug injection cartridge which provides a cylinder of liquid medication to be injected, an injection orifice, and an injection piston. Forceful movement of the injection piston in the cylinder causes an injection jet of medication to be expelled from the injection orifice. The injection device also includes a hermetically sealed gas pressure capsule which remains sealed until the moment of injection and powers the jet injection after opening of this cartridge.

20 Claims, 4 Drawing Sheets

